

**HDP-CVD FILM FOR UPPERCLADDING APPLICATION IN OPTICAL
WAVEGUIDES**

ABSTRACT OF THE DISCLOSURE

An optical waveguide is formed on a substrate by first depositing an undercladding layer over the substrate. At least one core is formed over the undercladding layer. An uppercladding layer is then formed over the cores with a high-density plasma process. Deposition of the uppercladding layer may proceed by flowing an oxygen-containing gas, such as O₂, a silicon-containing gas, such as SiH₄, and a fluorine-containing gas, such as SiF₄, into a process chamber to produce a gaseous mixture. A high-density plasma, i.e. having a density of at least 10¹¹ ions/cm³, is generated from the gaseous mixture and then used to deposit a fluorinated silicate glass layer.

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